

JOINTS & FRACTURES

Anatomy & Physiology 1

CLASSIFICATION OF JOINTS

DEFINITION

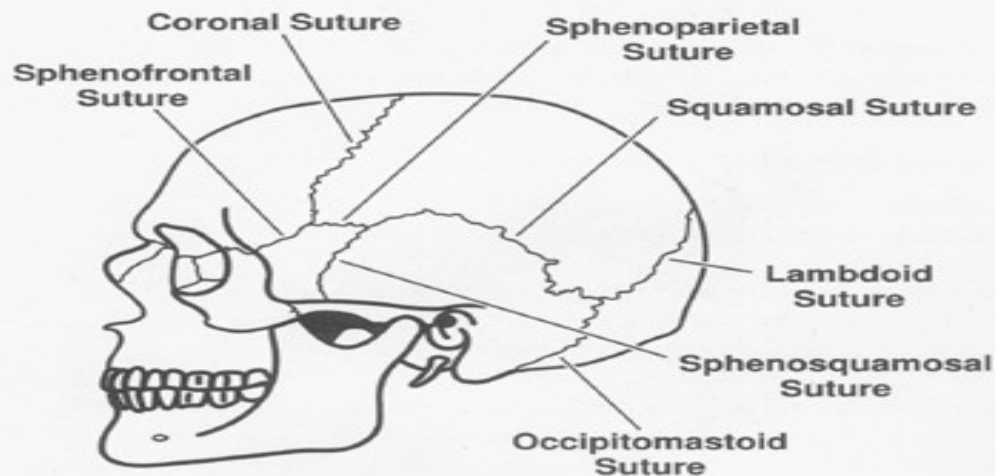
- A point of contact between two bones

TYPES

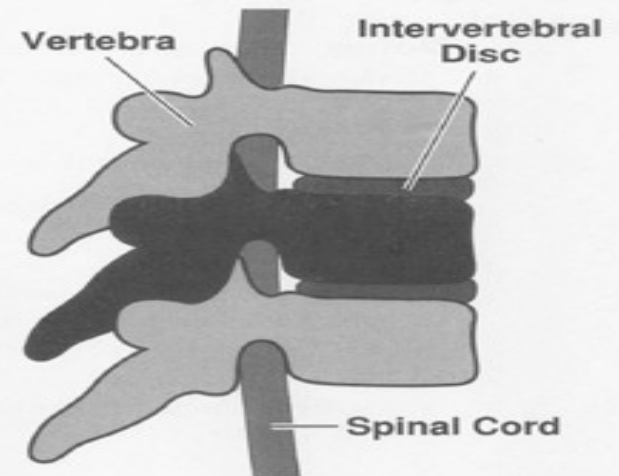
- Fibrous joint
- Cartilaginous joint
- Synovial joint (diarthrosis)

JOINTS (Articulations)

Synarthrosis (immovable joint)

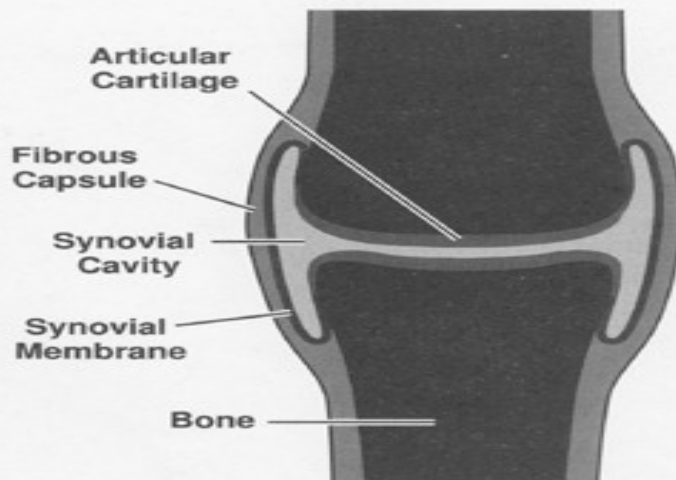


Amphiarthrosis (slightly movable joint)



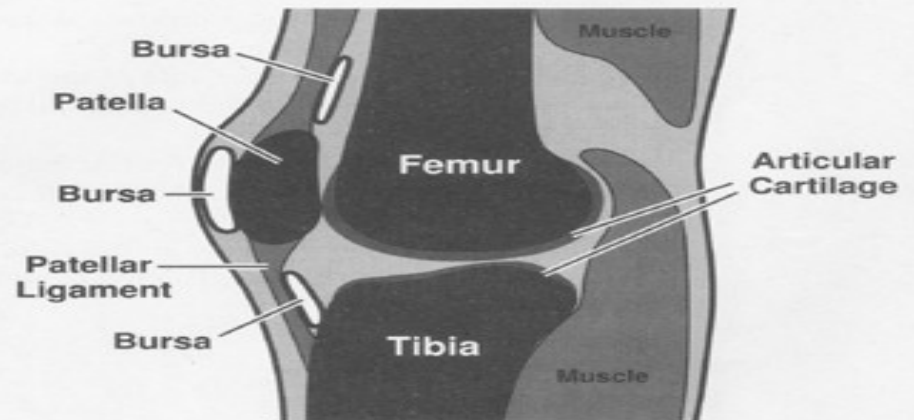
Diarthrosis (freely movable joint)

Synovial Joint (generalized)



Knee Joint

Patellofemoral : Synovial Gliding Type
Lateral Tibiofemoral : Synovial Hinge Type
Medial Tibiofemoral : Synovial Hinge Type



FIBROUS JOINTS

- Sutures
 - Fontanelles
- Syndesmosis
 - E.g., interosseous membrane
- Gomphosis
 - Peridontal ligament

CARTILAGINOUS JOINTS

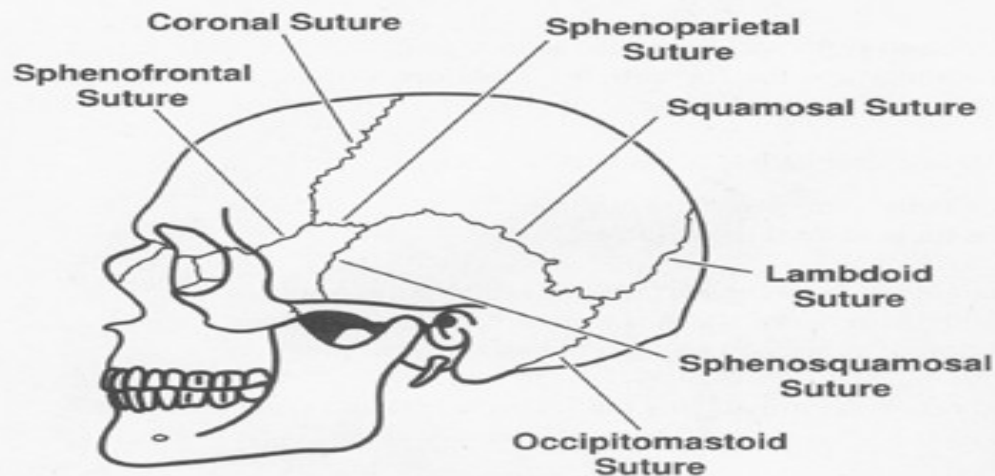
- Primary cartilaginous joint
 - Synchondroses
- Secondary cartilaginous joint
 - Symphyses
 - Fibrocartilaginous joints

SYNOVIAL JOINTS

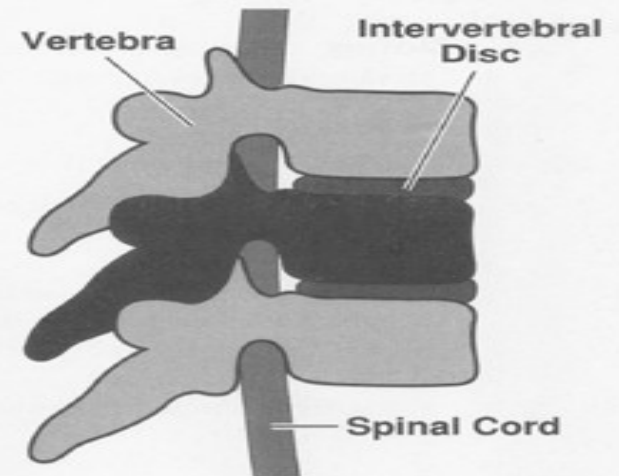
- Most common of all the joints
 - Six (6) types
- Lined (surrounded by) a synovial capsule (membrane)
 - Produces synovial fluid
 - May regenerate

JOINTS (Articulations)

Synarthrosis (immovable joint)

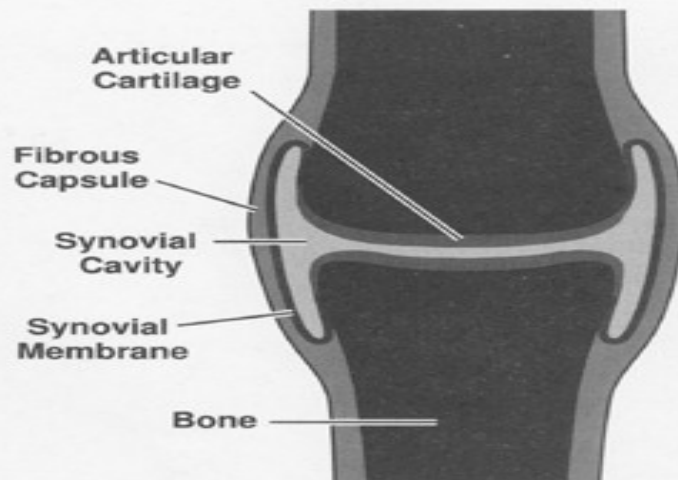


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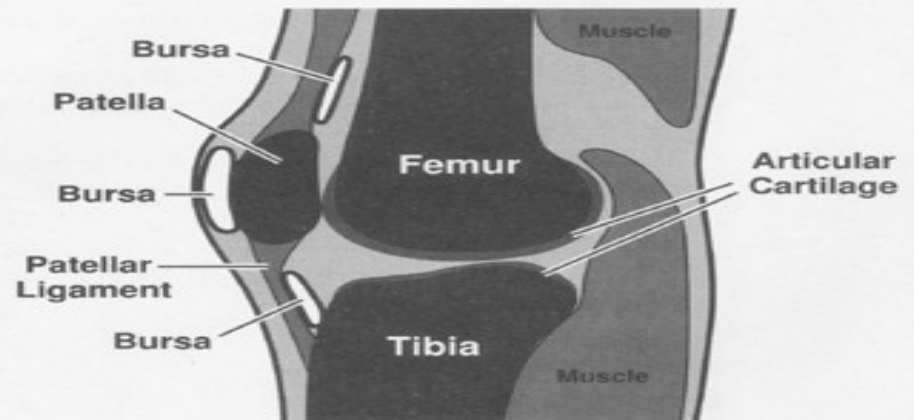
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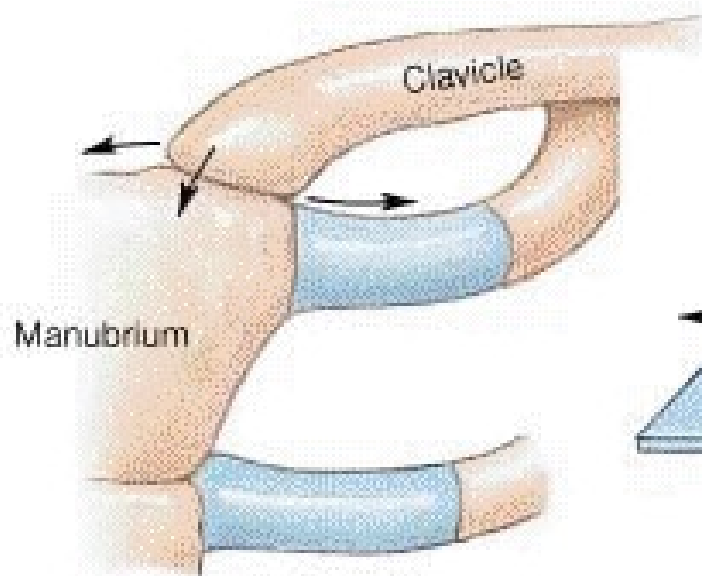
Knee Joint

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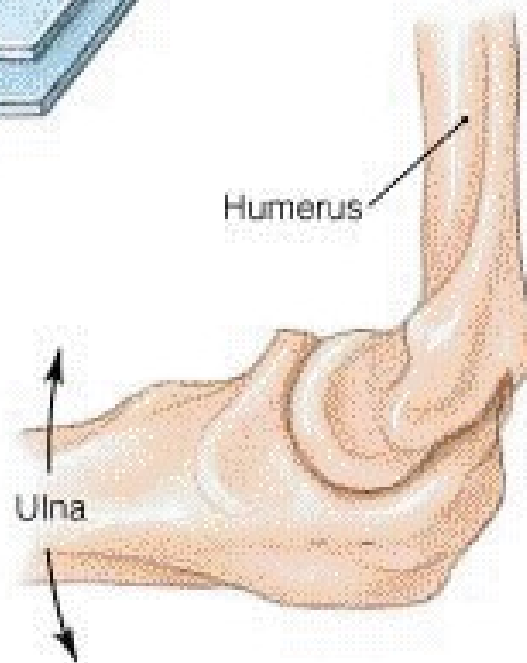
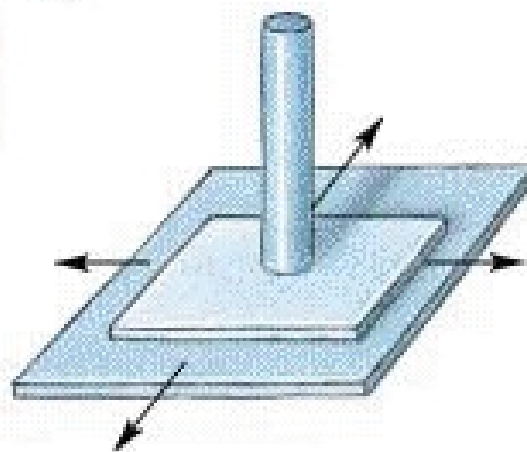


TYPES

- Plane (gliding) joints
- Hinge joints



(a) Gliding joint



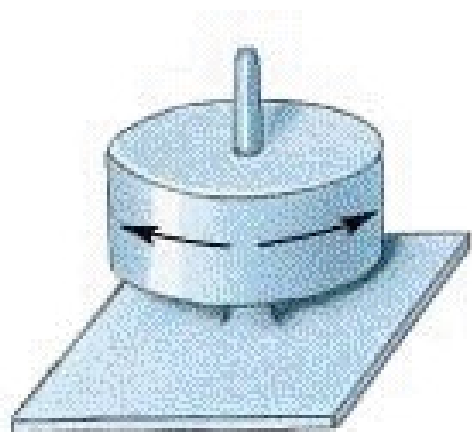
(b) Hinge joint



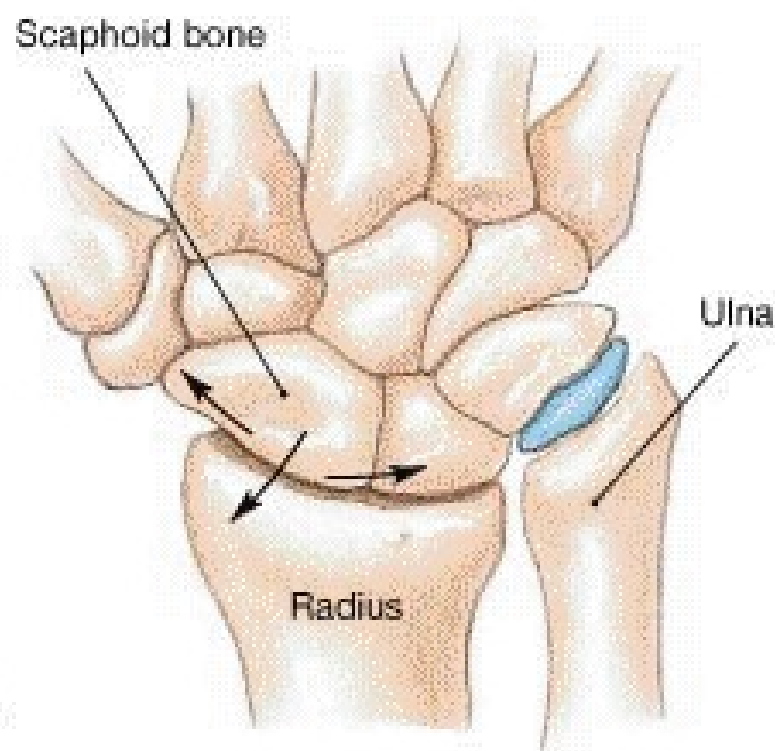
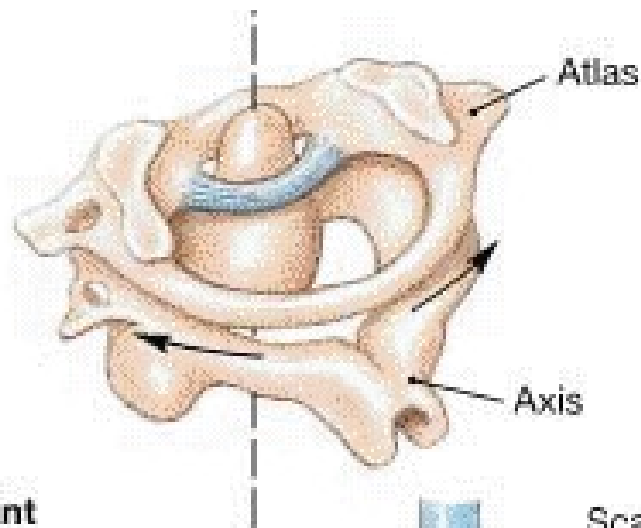
• **FIGURE 9-6 A Functional Classification of Synovial Joints**

TYPES

- Pivot joints
- Ellipsoid (condyloid) joints



(c) Pivot joint

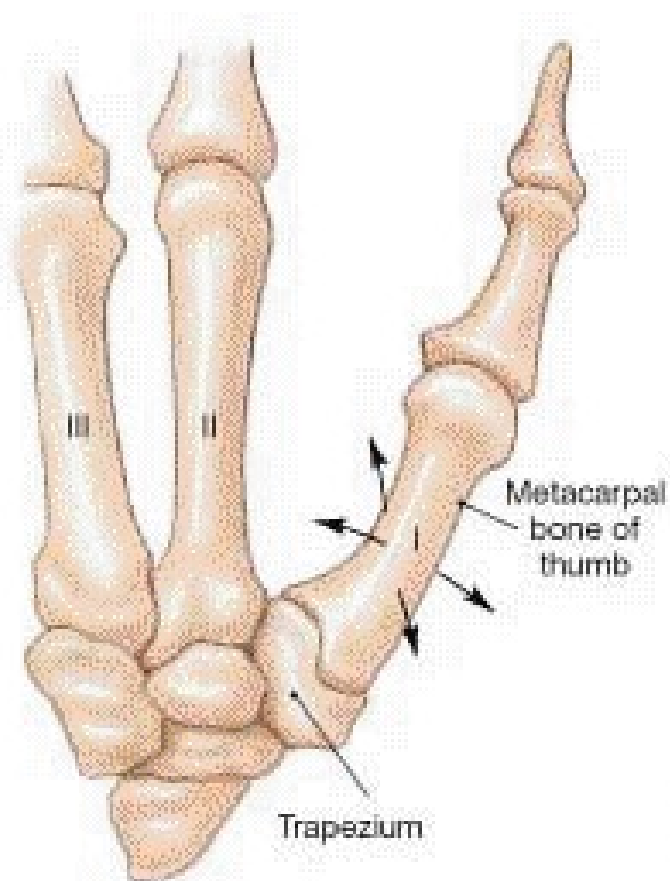


(d) Ellipsoidal joint

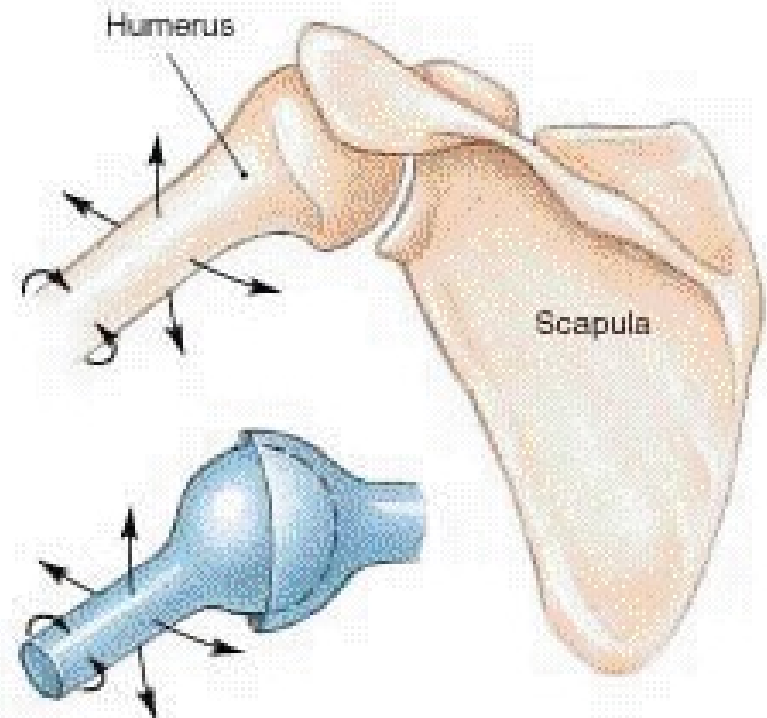
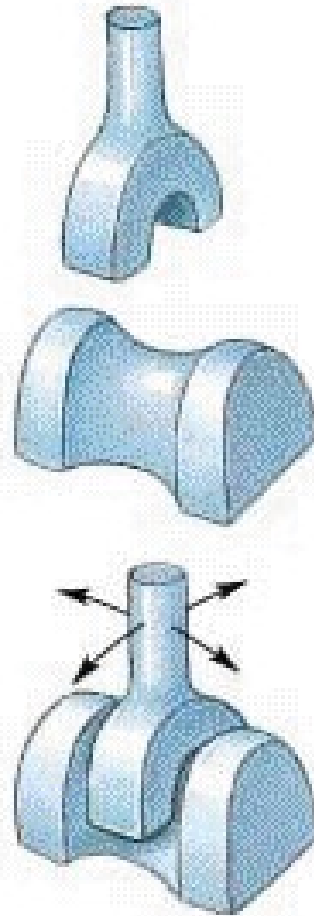
• **FIGURE 9-6** A Functional Classification of Synovial Joints

TYPES

- Saddle joints
- Ball-and-socket joints



(e) Saddle joint

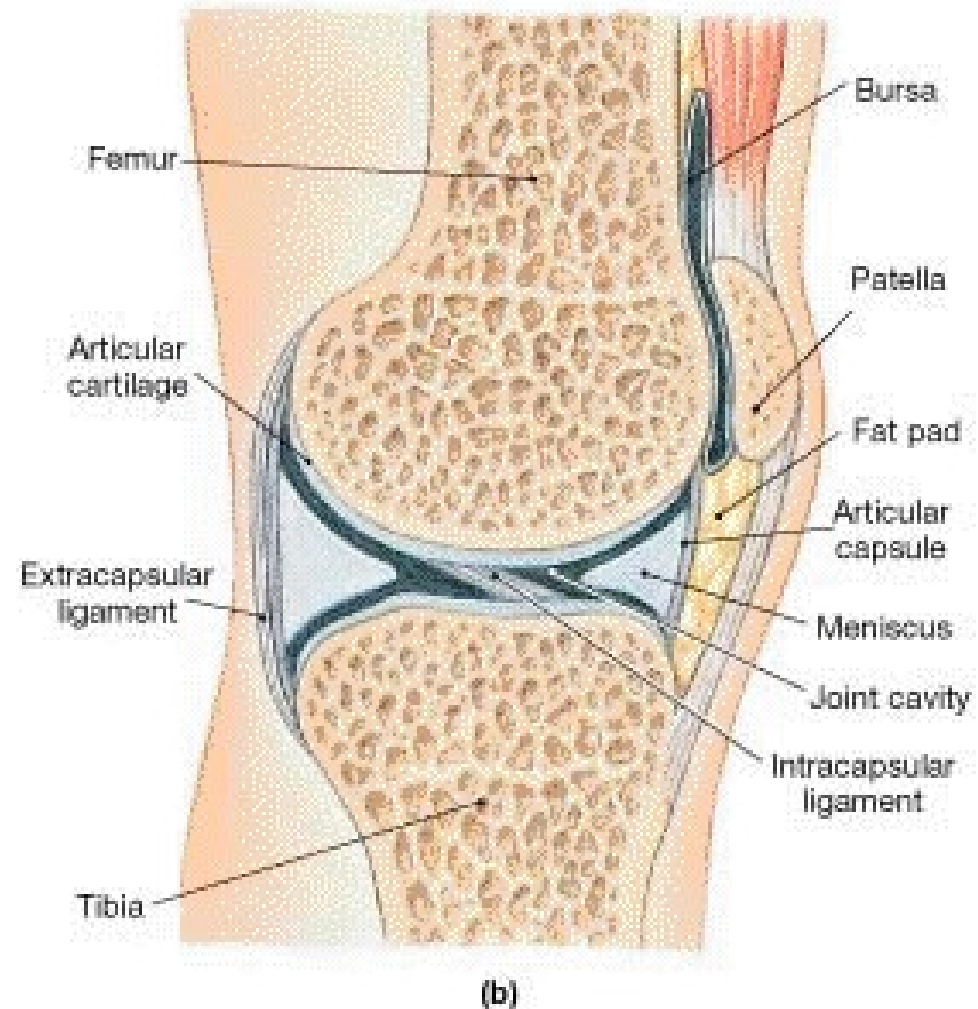
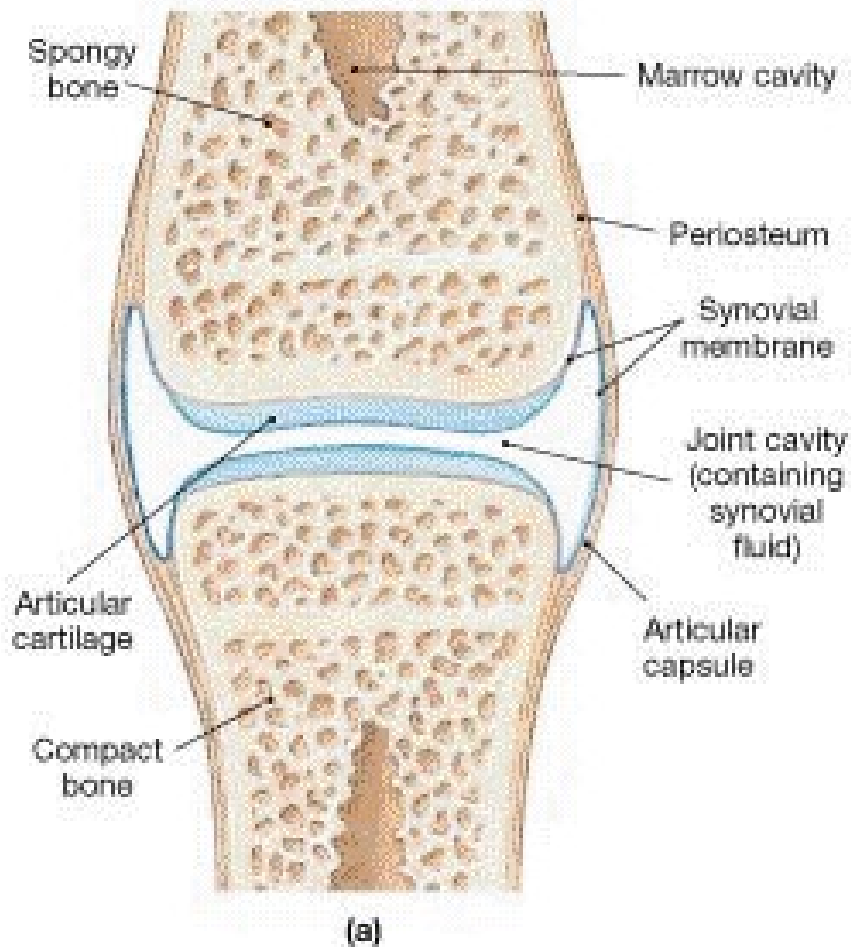


(f) Ball-and-socket joint

• **FIGURE 9-6 A Functional Classification of Synovial Joints**

SYNOVIAL JOINTS

- Have:
 - A joint cavity
 - An articular cartilage
 - An articular capsule



• **FIGURE 9-1 The Structure of a Synovial Joint.** (a) Diagrammatic view of a simple articulation. (b) A simplified sectional view of the knee joint.

Movements at Synovial Joints

- Movements at synovial joints are produced by the actions of skeletal muscles. When the muscle contracts, the movable end (insertion) is pulled toward the fixed end (origin), and a movement occurs at the joint.

Movements at Synovial Joints

- **Gliding** - One surface moves back and forth and from side to side over another surface.
 - Example: joint between the navicular and the 2nd and 3rd cuneiforms of the tarsus (ankle).

Movements at Synovial Joints

- **Angular** - There is an increase or decrease at the angle between bones.
 - *Abduction: movement* of a bone away from the midline.
 - *Adduction : movement* of a bone toward the midline.

Movements at Synovial Joints

- **Angular** - There is an increase or decrease at the angle between bones.
 - *Flexion*: decrease in the angle between the surfaces of articulating bones.
 - *Extension* : *increase* in the angle between the surfaces of articulating bones.
 - *Hyperextension* continuation of extension beyond the anatomical position.

Movements at Synovial Joints

- *Circumduction* distal end of a bone moves in a circle; proximal end remains stable.
- **Rotation** Movement of a bone around its longitudinal axis; may be medial or lateral.
 - Example : rotational movement at ball-and-socket joints (shoulder and hip joints).

Movements at Synovial Joints

- **Special**

- *elevation*: movement of a body part upward.
- *depression*: movement of a body part downward.
- *protraction* movement of mandible or shoulder forward, parallel to the ground.

Movements at Synovial Joints

- *retraction* : movement of a protracted part backward, parallel to the ground.
- *eversion* : movement of the sole of the foot outward.
- *inversion* : movement of the sole of the foot inward.
- *dorsiflexion* : bending of the foot in the direction of the upper surface (dorsum).

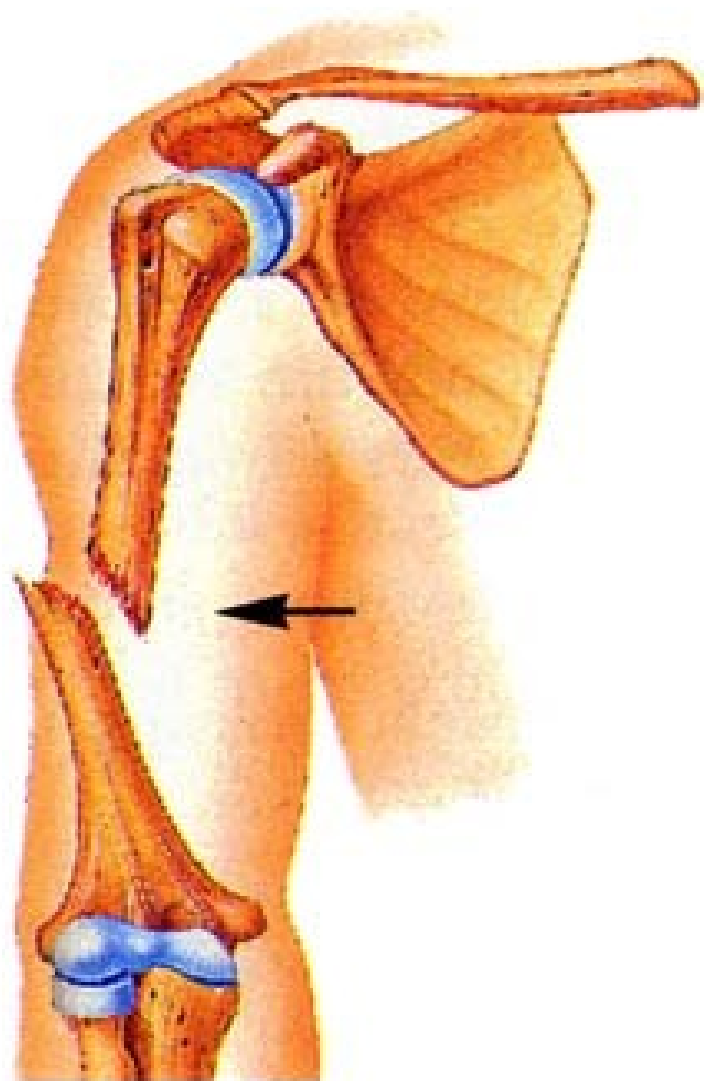
Movements at Synovial Joints

- *plantarflexion* : bending of the foot in the direction of the sole (plantar surface).
- *supination* turning the hand so the palm is upward.
- *pronation* turning the hand so the palm is downward.

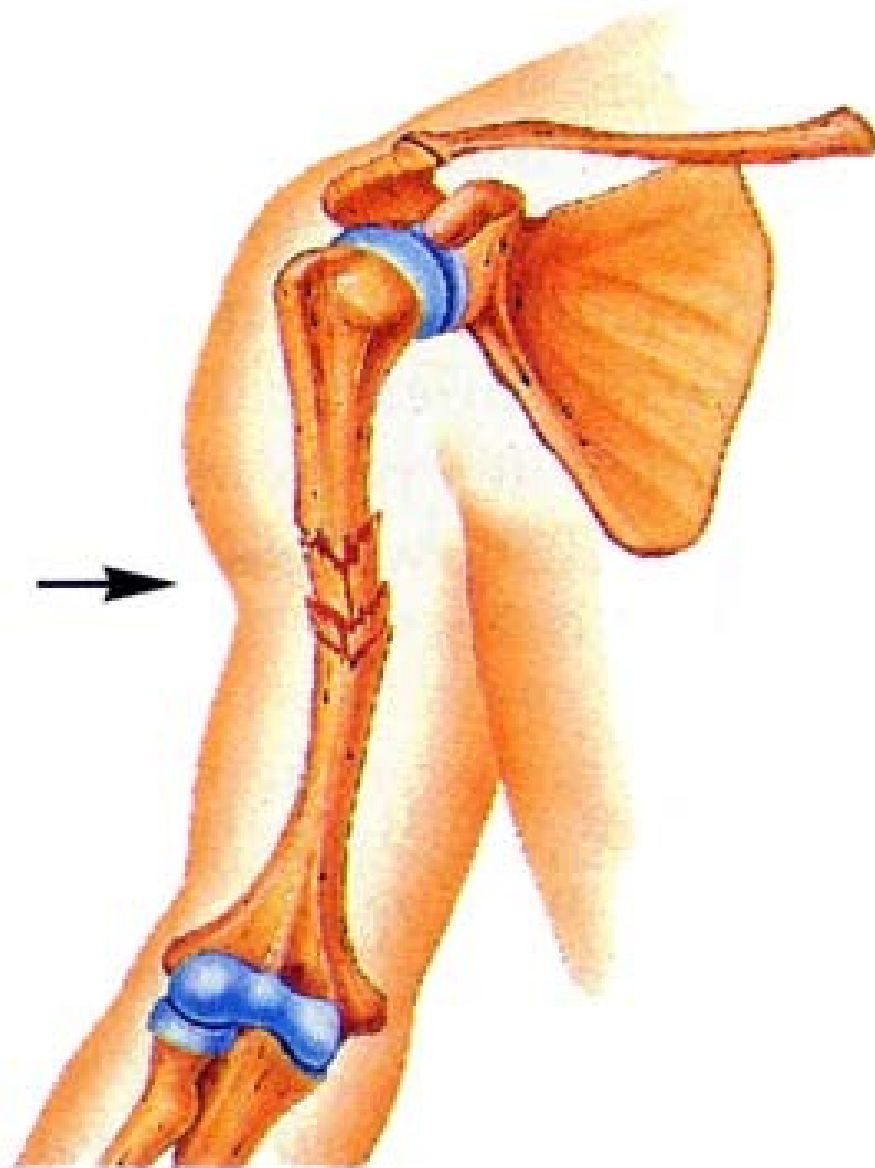
CLASSIFICATION OF FRACTURES

CATEGORIES

- Partial: incomplete
- Complete: across bone \Rightarrow 2 pieces
- Closed (simple): skin unbroken
- Open (compound): skin broken
- Comminuted: splintered
- Greenstick: one side bends
- Spiral: bone twisted apart



(a) Open fracture



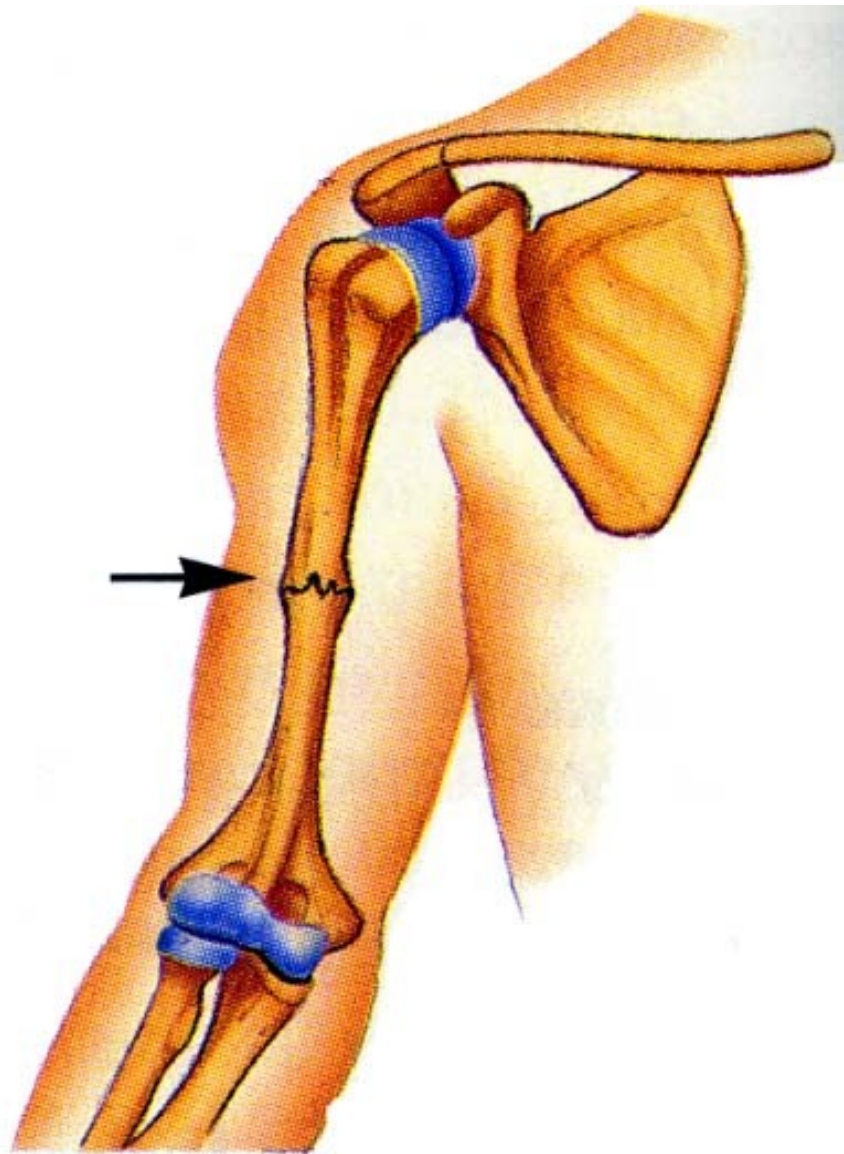
(b) Comminuted fracture

CATEGORIES (cont.)

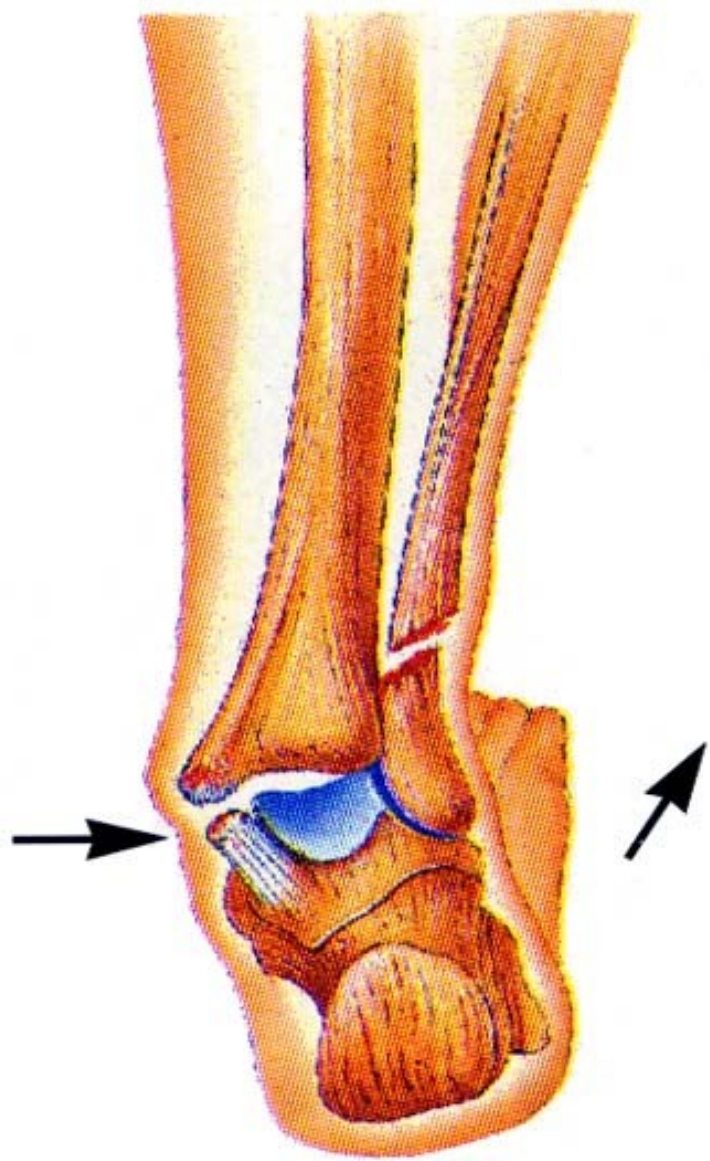
- Transverse: right angle to long axis
- Impacted: driven into each other
- Displaced: alignment lost
- Nondisplaced: alignment preserved
- Stress: microscopic
- Pathologic: weakened by disease



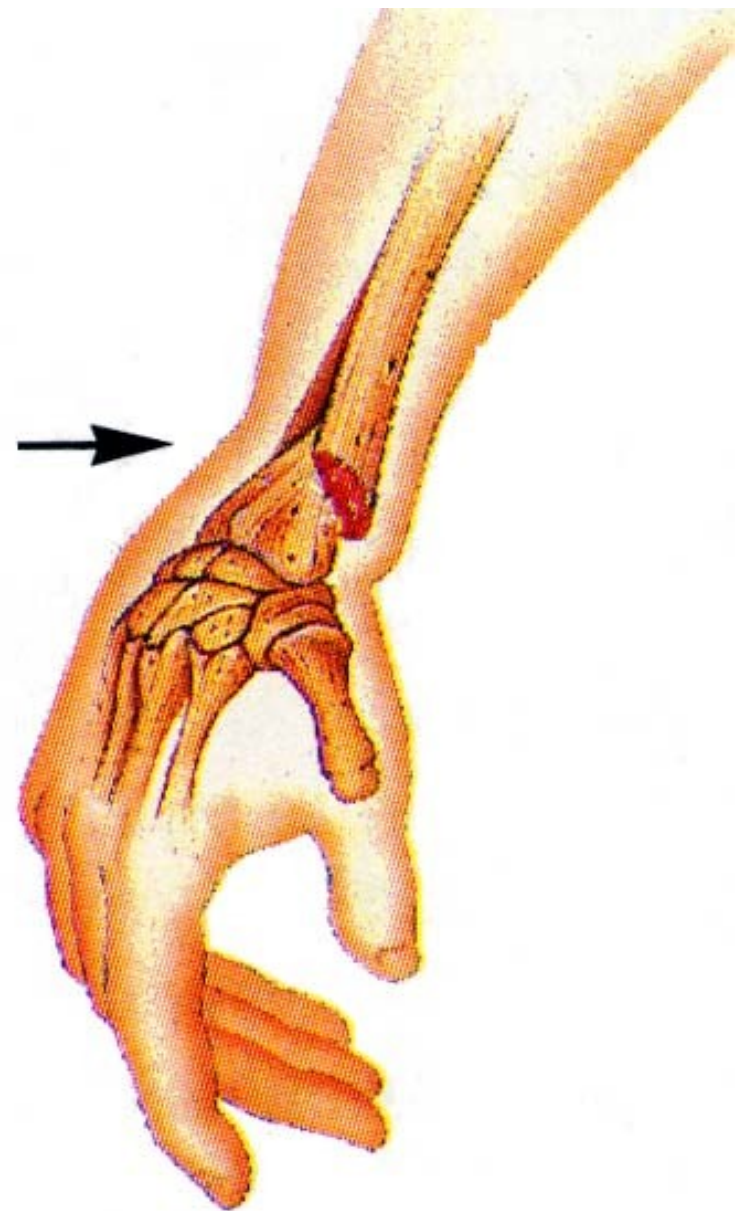
(c) Greenstick fracture



(d) Impacted fracture



(e) Pott's fracture



(f) Colles' fracture

QUESTIONS ?